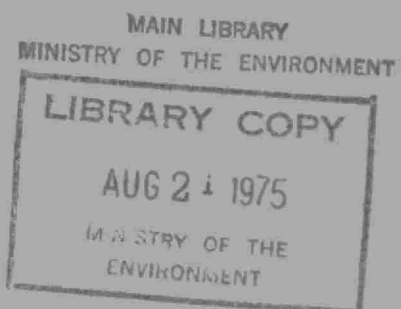




THE
ONTARIO WATER RESOURCES
COMMISSION
BRIEF ON
MIDDLE GRAND RIVER REGION
WATER SUPPLY STUDY

JANUARY 1967



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BRIEF

ON

MIDDLE GRAND RIVER REGION

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INTRODUCTION

On November 15, 1966 a report on the present and future water needs, availability and sources of supply was completed by Commission staff. The following is a resume of this report.

POPULATION

The 1965 population in the region was 279,000 persons. According to estimates, population will increase to 504,000 persons by 1986. It is expected that the average daily water demand will increase correspondingly from 25 million gallons to 59 million gallons and the maximum daily demand from 40 million gallons to 118 million gallons.

EXISTING WATER SUPPLIES

At the present time, ground water is the exclusive source of supply for all of the municipalities in the study area. Estimates of the amount of ground water available for future use indicate that approximately 22 mgd of good quality water are not being used at the present time. This is present principally in the Galt-Preston and Guelph areas.

FUTURE GROUND WATER SUPPLIES

The above estimates led to the conclusion that Guelph, Galt, Preston, Hespeler and Paris would be able

to locate sufficient ground-water supplies to accommodate them for the next 20 years. The Kitchener-Waterloo-Bridgeport complex, on the other hand, will probably have exhausted the ground-water supplies in its vicinity within the next 5 to 10 years. The outlying municipalities of Ayr, Elmira, Elora, Fergus, New Hamburg and Wellesley should consider maintaining and expanding their ground-water supplies indefinitely. Sufficient quantities are available in the vicinity of these municipalities to allow this.

FUTURE SURFACE WATER SUPPLIES

To provide the additional supply that will be necessary to meet the demands of the Kitchener-Waterloo-Bridgeport area in the immediate future, and the Galt, Guelph, Hespeler, Paris and Preston areas beyond 1986 the following surface waters were considered.

Grand River

The obvious advantage of utilizing impoundment reservoirs on the Grand River for water supply is its proximity to the developing areas. However, it is felt that there are many disadvantages which outweigh this. A brief discussion of these is as follows:

1. There is a lack of reservoir sites that would provide a suitable water depth. A water depth of 40 to 50 feet is considered desirable in order to provide cold water free of surface pollutants particularly algae which greatly complicate treatment processes.

2. The susceptibility of impoundment reservoirs to algae growths and other nuisance aquatic growths due to the inherent fertility of the waters of the Grand would in all probability complicate treatment processes even if adequate water depths can be provided in the reservoirs.

3. Disregarding the aspect of fertility, the quality of the Grand River water is inferior to that of the Great Lakes. The level of hardness is more than twice that of Lake Erie, and the iron content is greater than Lake Erie also. In addition colour, turbidity and also temperature levels will fluctuate more widely and be generally higher than those in any of the Great Lakes.

4. One of the main uses of the Grand River today is the dilution of waste effluents. With greater development in the area, the importance of this use will increase. By 1986 it is expected that the flow in the Grand River at Galt will only just meet the dilution requirement of 6 parts of river water to one part of waste effluent, even if the five additional impoundment reservoirs planned by the Grand River Conservation

Authority are constructed. Therefore any water used for supply purposes will reduce the available dilution. The result would be an increase in pollution levels in the river.

5. Another important consideration is that the use of impoundment reservoirs for water supply will restrict other uses, such as recreation, to some extent.

For these reasons, it was decided that the Grand River should not be considered as a source of water supply for the region. The possibility of utilizing the river temporarily would depend entirely on economic considerations. This would be doubtful however as it appears that ultimately a pipeline from one of the Great Lakes will be necessary.

Great Lakes

The following table illustrates some pertinent criteria concerning the Great Lakes.

	<u>Distance From Study Area</u>	<u>Elevation</u>	<u>Static Head</u>	<u>Quality</u>
Erie	50 miles	570 ft.	530 ft.	Good
Georgian Bay	75 miles	580 ft.	1,170 ft.	Excellent
Huron	75 miles	580 ft.	620 ft.	Excellent
Ontario	30 miles	246 ft.	854 ft.	Good

The quality of the water from all of the Great Lakes is satisfactory for domestic water supplies. Because of their distance from the development area, Georgian Bay and Lake Huron would be the most expensive systems to build.

In addition the power costs to bring water from Georgian Bay would be the highest of the four as the static head to be overcome is the greatest. Lake Ontario is the closest and would require the shortest intake; however, the static head is the second highest. Lake Erie is farther away than Lake Ontario and would require a considerably longer intake; however, the static head involved is the least.

In order to determine which was the most suitable of the four sources, an economic study which included considerations of material costs, construction costs, operating power costs and engineering and contingencies was undertaken. In addition, allowances had to be made for the proposed Lower Grand Valley Region Water Supply System which would be affected by any system utilizing Lake Erie as the source of supply.

CONCLUSIONS

1. Ayr, Elmira, Elora, Fergus, New Hamburg, and Wellesley can continue to utilize ground water sources of supply indefinitely.

2. The Kitchener-Waterloo-Bridgeport complex will require a source of supply other than ground water within the next 5 to 10 years.

3. The Galt, Guelph, Hespeler, Paris and Preston areas can continue to develop on ground water for the next 20 years. Beyond that an alternate source of supply will be required.

4. It is practical to enlarge and extend the Lower Grand Valley Water Supply System beyond Brantford to serve the Kitchener-Waterloo-Bridgeport complex until 1986.

5. Beyond 1986 a pipeline from Lake Ontario can be constructed to serve the Galt, Guelph, Hespeler and Preston areas and to provide increased supplies for the Kitchener-Waterloo-Bridgeport complex. This will enable additional water to be supplied to Brantford and also to Paris to meet their ultimate demands and provide needed flexibility in the supply systems. This schedule of construction will also allow a period of time after the construction of the Lower Grand Valley System to evaluate the overall programme and determine the requirements of the region more accurately.